## CITY OF HELENA PROJECT #17-08 HENDERSON STREET DRAINAGE IMPROVEMENTS CONSTRUCTION PLANS

PROJECT LOCATION

CUT BANK HAVRE

HARDIN

KALISPELL

MALTA

HARDIN

GREAT FALLS

GLENDIVE

HARDIN

BUTTE

BUTTE

BULLINGS

HARDIN

RED

LODGE

MONTANA STATE MAP

APPROVED BY:

CITY OF HELENA

CITY ENGINEER

DIRECTOR OF PUBLIC WORKS

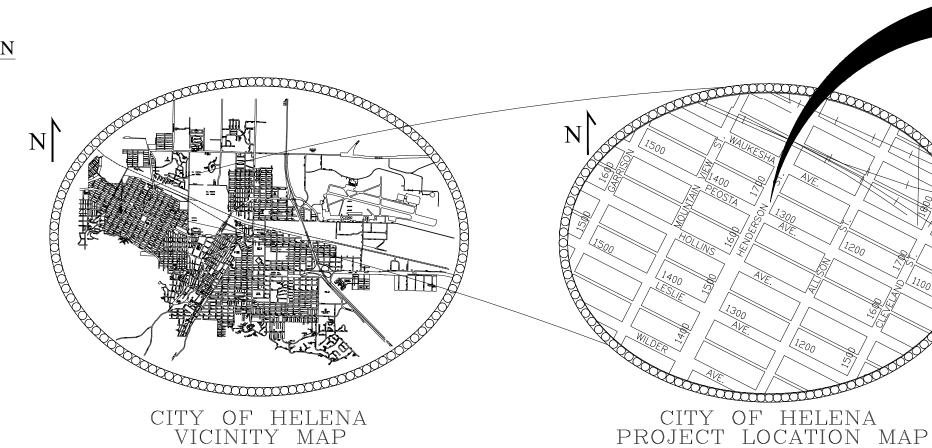
PREPARED BY:

CITY ENGINEERING DIVISION

CITY OF HELENA

316 NORTH PARK AVENUE

HELENA, MONTANA



SEPTEMBER 2017



## INDEX OF SHEETS

SHEET 1	COVER
SHEET 2	PROJECT NOTES AND LEGEND
SHEET 3	PLAN AND PROFILE, STA. 0+00 TO 5+50
SHEET 4	PLAN AND PROFILE, STA. 5+50 TO 10+50
SHEET 5	PLAN AND PROFILE, STA. 10+50 TO 15+00
SHEET 6	LANDSCAPE PLAN
SHEET 7	GENERAL DETAILS

PROJECT LOCATION

ENGINEERING\PROJECT FILES\17 Projects\17-08 Henderson Ave Drainage Improvements\plans\HENDERSON ADDEND\

## **GENERAL PROJECT NOTES:**

- 1. CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS FOR CONSTRUCTION, DEWATERING AND STORMWATER DISCHARGES AT THEIR OWN EXPENSE.
- 2. CONTRACTOR SHALL BE RESPONSIBLE FOR USE OF STORM WATER BEST MANAGEMENT PRACTICES (BMPS) TO CONTROL STORMWATER RUNOFF AND RUNON TO EACH PROJECT AREA. BMPS SHALL BE IMPLEMENTED FOR ANY STORMWATER COLLECTED PRIOR TO ANY DISCHARGE TO THE MUNICIPAL STORM SEWER SYSTEM.
- 3. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DUST CONTROL DURING CONSTRUCTION.
- 4. THE LATEST EDITION OF THE CITY OF HELENA ENGINEERING AND DESIGN STANDARDS AND THE MONTANA PUBLIC WORKS STANDARDS (IN THAT ORDER) SHALL APPLY IN THE CASE OF ANY APPLICABLE CLARIFICATION OR INTERPRETATION OF THE PROJECT DRAWINGS OR SPECIFICATIONS.
- 5. WHEN WORKING NEAR AND/OR EXPOSING EXISTING UTILITIES AND SERVICE LINES, WORKERS SHALL UTILIZE HAND-DIGGING METHODS IN ORDER TO AVOID DAMAGE TO THOSE UTILITIES. IF DAMAGE OCCURS, THE COST OF REPAIR WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 6. THE OWNER AND ALL AFFECTED RESIDENTS SHALL BE NOTIFIED NO LATER THAN ONE WEEK PRIOR TO CONSTRUCTION THAT WILL IMPACT ACCESSIBILITY TO THEIR PROPERTY, PARKING OR SERVICES.
- 7. ALL ASPHALT, CONCRETE AND CURB AND GUTTER THAT IS DEMOLISHED OR REMOVED UNDER THIS AGREEMENT SHALL BE PROPERLY DISPOSED OF AND ALL COSTS THEREOF SHALL BE BORNE BY THE CONTRACTOR.
- 8. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO DEMOLITION, INSTALLATION OR PLANTING OPERATIONS. ANY DAMAGE TO OR RESULTING FROM ENCOUNTERING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 9. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RETURNED TO THEIR PRE-CONSTRUCTION CONDITION AT THE SOLE EXPENSE OF THE CONTRACTOR.
- 10. A PORTION OF THE PROJECT INVOLVES THE REMOVAL AND INSTALLATION OF INFRASTRUCTURE WITHIN THE TRAVELED RIGHT-OF-WAY. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL MEASURES NECESSARY TO ASSURE SAFE AND EFFICIENT FLOW OF VEHICULAR AND PEDESTRIAN TRAFFIC THROUGH THE CONSTRUCTION AREA(S).
- 11. A NEAT, VERTICAL SAWCUT SHALL BE MADE WHEREVER ASPHALT, CONCRETE, SIDEWALK OR CURB AND GUTTER REMOVAL ABUTS EXISTING INFRASTRUCTURE TO REMAIN.
- 12. SEWER BYPASS PUMPING IS NOT PAID FOR AS A SEPARATE BID ITEM UNLESS NOTED ON THE BID SHEETS. SEWER BYPASS PUMPING IS CONSIDERED INCIDENTAL TO THE WORK IN ALL LOCATIONS AND SEPARATE PAYMENT WILL NOT BE MADE FOR PUMPING IF NEEDED.
- 13. DISPOSE OF ALL EXCAVATED SOIL, DEBRIS, ASPHALT, AND CONCRETE OFF THE PROJECT SITE AND IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

## PROJECT UTILITY NOTES:

- 1. THE ENGINEER HAS OBTAINED UNDERGROUND UTILITY INFORMATION FROM OWNERS OF THE UNDERGROUND UTILITIES AND HAS INCLUDED THAT INFORMATION AS PART OF THESE PLANS. THIS UTILITY LOCATION INFORMATION IS APPROXIMATE AND MAY BE INCOMPLETE OR INACCURATE.
- 2. BEFORE BEGINNING ANY EXCAVATION, THE CONTRACTOR SHALL NOTIFY, THROUGH ONE-CALL NOTIFICATION CENTER, ALL OWNERS OF UNDERGROUND FACILITIES IN THE AREA OF THE PROPOSED EXCAVATION. THE PHONE NUMBER IS: 1-800-424-5555.
- 3. AFTER AN OWNER OF AN UNDERGROUND FACILITY HAS LOCATED AND MARKED THE UNDERGROUND FACILITIES, THE CONTRACTOR SHALL DETERMINE IF WEATHER, TIME OR OTHER FACTORS MAY HAVE AFFECTED LOCATION MARKS, WARRANTING RELOCATION OF THE UTILITIES.
- 4. IF EXCAVATION HAS NOT OCCURRED WITHIN 30 DAYS OF THE LOCATE AND MARK, THE CONTRACTOR SHALL REQUEST THAT THE FACILITY BE RELOCATED AND REMARKED BEFORE EXCAVATING UNLESS OTHER ARRANGEMENTS HAVE BEEN MADE WITH THE UNDERGROUND FACILITY OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH RELOCATING AND REMARKING A FACILITY THAT IS NOT EXCAVATED WITHIN 30 DAYS OF THE LOCATE AND MARK.
- 5. THE CONTRACTOR MAY NOT BEGIN EXCAVATION BEFORE THE LOCATING AND MARKING IS COMPLETE OR BEFORE THE CONTRACTOR IS NOTIFIED THAT LOCATING AND MARKING IS UNNECESSARY.
- 6. THE CONTRACTOR SHALL LOCATE AND MARK THE AREA TO BE EXCAVATED IF REQUESTED BY THE UNDERGROUND FACILITY OWNER OR THEIR REPRESENTATIVE. IF THE CONTRACTOR DISCOVERS AN UNDERGROUND FACILITY THAT HAS NOT BEEN LOCATED AND MARKED, THE CONTRACTOR SHALL STOP EXCAVATING IN THE VICINITY OF THE FACILITY AND NOTIFY THE FACILITY OWNER OR THE ONE-CALL NOTIFICATION CENTER. IF THIS OCCURS, THE CONTRACTOR SHALL PROCEED WITH OTHER ELEMENTS OF THE PROJECT, AT NO COST TO THE PROJECT OWNER, UNTIL THE UNDERGROUND FACILITY OWNER HAS NOTIFIED THE CONTRACTOR THAT EXCAVATION CAN PROCEED.

## MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS

The following sections of the Montana Public Works Standard Specifications (MPWSS), Sixth Edition, April 2010 are incorporated by reference.

## **DIVISION 1 - GENERAL REQUIREMENTS**

Section 01010	Summary of Work
Section 01041	Project Coordination
Section 01050	Field Engineering
Section 01090	References
Section 01300	Submittals
Section 01400	Contractor Quality Control and Owner Quality Assurance
Section 01500	Construction and Temporary Facilities
Section 01570	Construction Traffic Control
Section 01700	Contract Closeout

## **DIVISION 2 - SITE WORK**

Section 02112	Removal of Existing Pavement, Concrete, Curb, Sidewalk, Driveway and/or Structures.
Section 02114	Relocating or Removing Utility Poles, Street Signs and Mailboxes.
Section 02221	Trench Excavation and Backfill for Pipelines and Appurtenant Structures.
Section 02230	Street Excavation, Backfill and Compaction.
Section 02234	Sub Base Course
Section 02235	Crushed Base Course
Section 02502	Asphalt Prime and/or Tack Coat
Section 02510	Asphalt Concrete Pavement
Section 02528	Concrete Curb and Gutter
Section 02529	Concrete Sidewalks, Driveways, Approaches, Curb Turn Fillets, Valley Gutters and Miscellaneous New Concrete Construction.
Section 02600	Water Distribution
Section 02720	Storm Drain Systems
Section 02910	Seeding

## **DIVISION 3 - CONCRETE**

Section 03210 Reinforcing Steel
Section 03310 Structural Concrete

## APPENDIX A - APPLICABLE MONTANA PUBLIC WORKS STANDARD DRAWINGS

Standard Drawing No. 02221-1: Typical Utility Trench
Standard Drawing No. 02221-2: Pipe Bedding Alternate
Standard Drawing No. 02660-1: Thrust Blocking Water Main Fittings
Standard Drawing No. 02660-2: Water and Sewer Main Separation
Standard Drawing No. 02720-3: Sanitary Sewer and Storm Drain Manhole

Standard Drawing No. 02720-6: Precast Manhole Bases

## **APPENDIX A - APPLICABLE CITY OF HELENA STANDARD DRAWINGS**

Standard Drawing No. 4-1: Standard Specification Inlets

Standard Drawing No. 4-5: Type 1 Drop Inlet

Standard Drawing No. 4-8: Tire and Concrete Wash Basin

Standard Drawing No. 4-9: Approved City Logo Manhole Lid "Storm Sewer" Lettering

## **ABBREVIATIONS**

ADDN	ADDITIONAL	N	NORTH
APPROX	APPROXIMATE	NTS	NOT TO SCALE
CMP	CORRUGATED METAL PIPE	RCP	REINFORCED CONCRETE PIPE
CULV CY	CULVERT CUBIC YARD	SD	STORM DRAIN
DET DI DWG ENGR EOP FES FET INV LF MAX MH MIN	DETAIL DUCTILE IRON, DRAIN INLET DRAWING ENGINEER EDGE OF PAVEMENT FLARED END SECTION FLARED END TERMINAL INVERT LINEAR FEET MAXIMUM MANHOLE MINIMUM	SDWK SS STD ST TB TBC TEL TYP UG UGP UGP UGT UTIL	SIDEWALK SANITARY SEWER SERVICE STANDARD STREET THRUST BLOCK TOP BACK OF CURB TELEPHONE TYPICAL UNDERGROUND UNDERGROUND POWER UNDERGROUND TELEPHONE UTILITY
MJ	MECHANICAL JOINT MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS	WTR	WATER
MPWSS		WV	WATER VALVE

PROJECT PLANS LEGEND/KEY:			
<del>4235.00</del>	EXISTING MAJOR TOPOGRAPHIC LINE (5' INTERVAL		
	EXISTING MINOR TOPOGRAPHIC LINE (1' INTERVAL)		
	EXISTING CURB AND GUTTER		
	EXISTING EDGE OF CONCRETE OR PAVEMENT		
	EXISTING EDGE OF GRAVEL ROAD SURFACE		
	- EXISTING BUILDING		
-00000	EXISTING FENCE (TYPE VARIES)		
	EXISTING UTILITY POLE		
	EXISTING LIGHT POLE		
	EXISTING OVERHEAD UTILITY		
———UGE ———UGE ———	EXISTING UNDERGROUND ELECTRICAL		
—— GAS —— GAS ——	EXISTING NATURAL GAS MAIN (SIZE UNKNOWN)		
— 12SD —— 12SD —	EXISTING 12 INCH DIAMETER RCP STORM SEWER		
— 18SD —— 18SD —	- EXISTING 18 INCH DIAMETER RCP STORM SEWER		
—— 24SD ——— 24SD —	- EXISTING 24 INCH DIAMETER RCP STORM SEWER		
— 302D — 302D —	EXISTING 30 INCH DIAMETER RCP STORM SEWER		
— 362D — 362D —	EXISTING 36 INCH DIAMETER RCP STORM SEWER		
	EXISTING STORM SEWER INLET		
	EXISTING VALLEY GUTTER		
4W 4W	EXISTING 4 INCH DIAMETER CI WATER MAIN		
6W 6W	EXISTING 6 INCH DIAMETER DI/CI WATER MAIN		
12W 12W	EXISTING 12 INCH DIAMETER DI WATER MAIN		
	EXISTING WATER SERVICE LINE (SIZE VARIES)		
×	EXISTING WATER VALVE AND VALVE RISER BOX		
	EXISTING FIRE HYDRANT		
W	EXISTING RESIDENTIAL IRRIGATION WELL		
6SAN 6SAN	- EXISTING 6 INCH VCP SEWER MAIN		
—— NA28 ——— NA28 ——	- EXISTING 8 INCH SEWER MAIN		
—— 6SAN ——— 6SAN —	- EXISTING 6 INCH SEWER SERVICE		
4SAN 4SAN	- EXISTING 4 INCH SEWER SERVICE		
$\bigcirc$	EXISTING 48" DIAMETER MANHOLE TO REMAIN		
— 8SAN — 8SAN —	NEW 8" SDR35 PVC SEWER MAIN		
$\bigcirc$	NEW 48" DIAMETER MANHOLE		
(2)	NEW 60" DIAMETER MANHOLE		
— 4SAN — 4SAN —	NEW 4 INCH SEWER SERVICE LINE EXTENSION		

## **GENERAL NOTES:**

1. 24 INCH CONCRETE PIPE, FLARED END SECTIONS (FES) AND TRASH RACKS SHALL BE LOADED, HAULED AND STOCKPILED AT THE CITY OF HELENA UTILITY MAINTENANCE YARD.

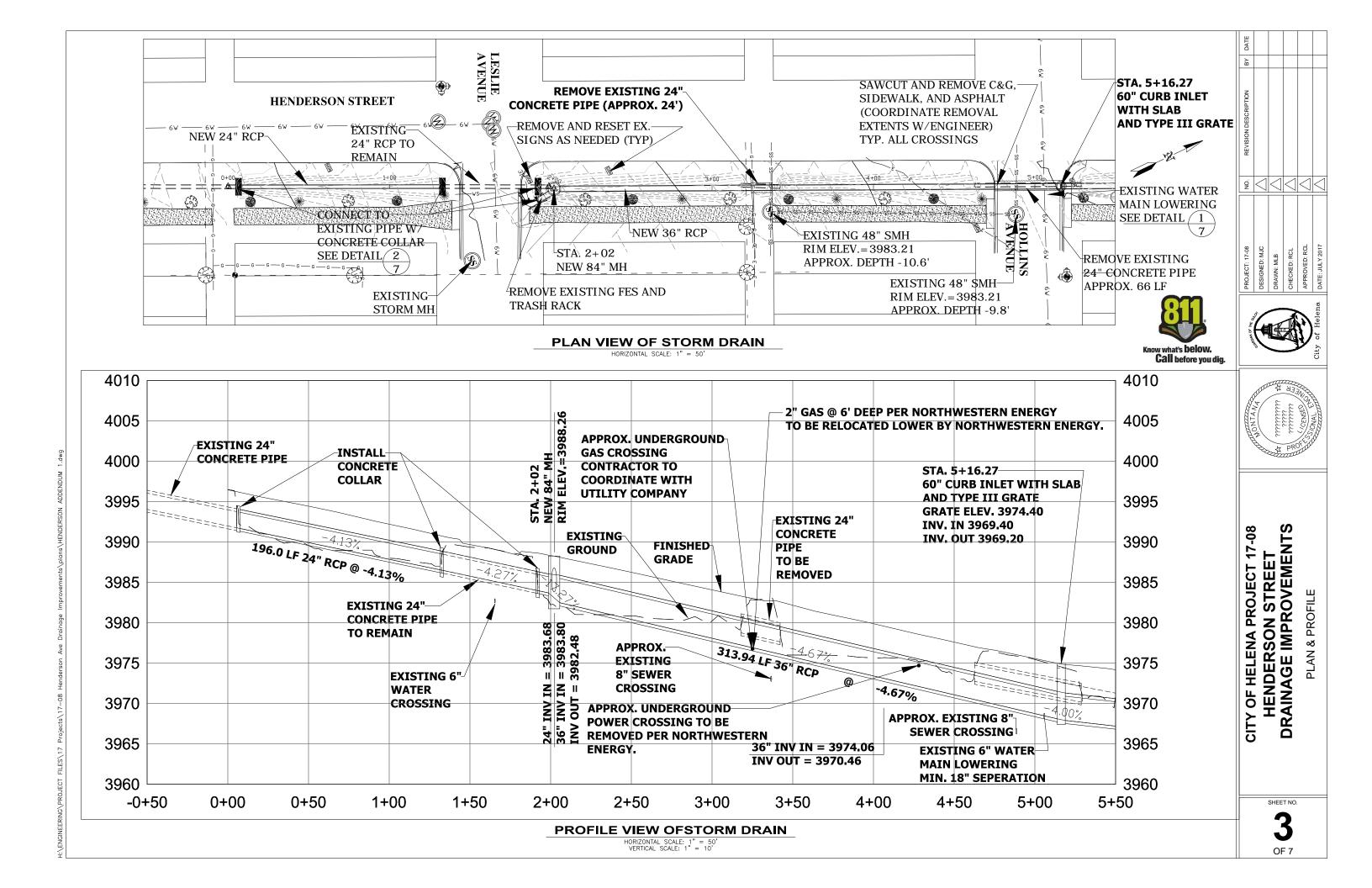
— 6SAN — 6SAN — NEW 6 INCH SEWER SERVICE LINE EXTENSION

2. SAW CUTTING CONCRETE AND ASPHALT IS INCIDENTAL TO REMOVAL AND DISPOSAL AS UNCLASSIFIED EXCAVATION.

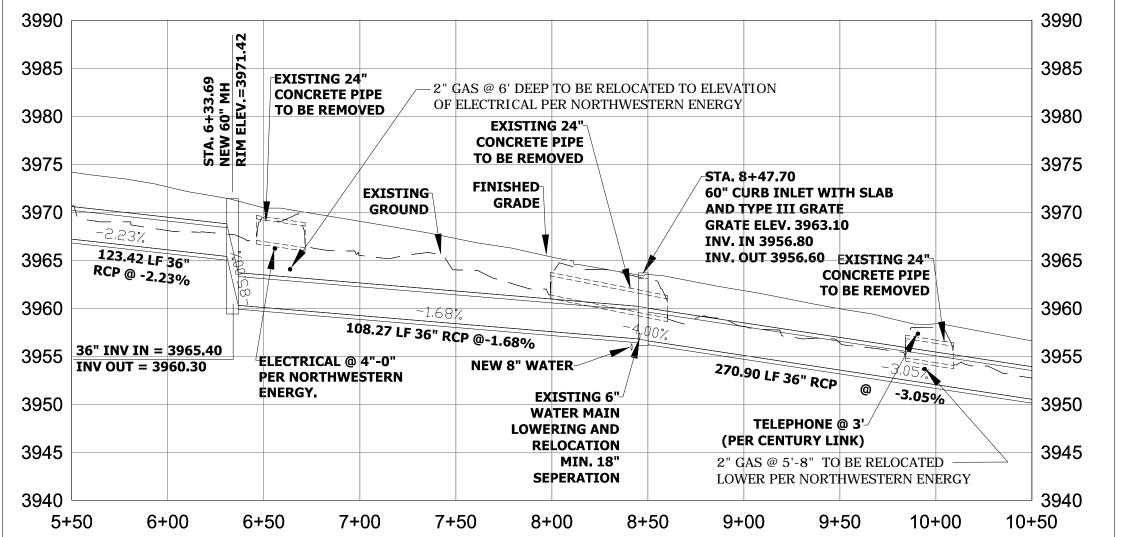
# CITY OF HELENA PROJECT 17-08 HENDERSON STREET DRAINAGE IMPROVEMENTS

**2**OF 7

SHEET NO



**PLAN VIEW OF STORM DRAIN** HORIZONTAL SCALE: 1" = 50



PROFILE VIEW OF STORM DRAIN







HENDERSON STREET DRAINAGE IMPROVEMENTS

**OF HELENA PROJECT 17-08** 

CITY

OF 7

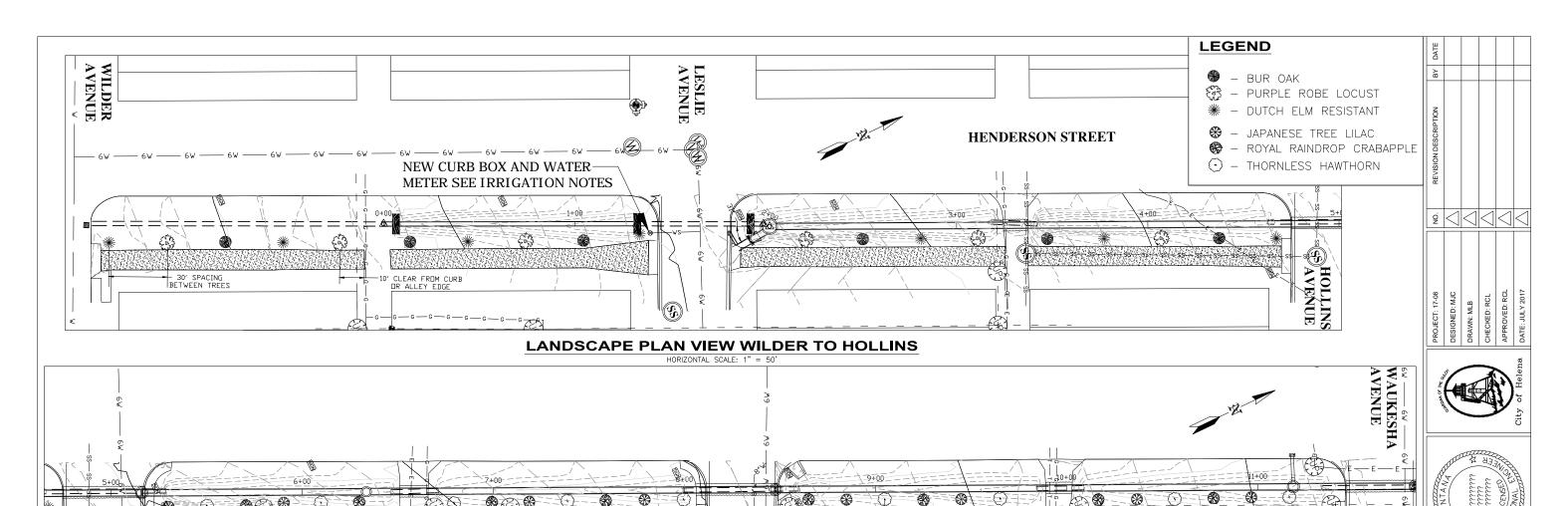
3970 3970 STA. 11+82.22 **EXISTING** =3954. **60** CURB INLET WITH 2" GAS @ 7'-3" DEEP PER NORTHWESTERN ENERGY 24" GAS CANNOT BE RELOCATED. 3965 CONCRETE SLAB 3965 11+18.6 7 60" MH ELEV = 3 AND TYPE III GRATE **PIPE GRATE ELEV. 3951.90** TO BE 3960 3960 **REMOVED** INV. IN 3945.60 now what's **below.** Call before you dig. INV. OUT 3945,40 STA. NEW RIM . 14+73 V 72" MH ELEV.=3944.0 47.7 MH **EXISTING** 3955 **EXISTING 24**" 3955 13+4 '60" | ELEV **GROUND CONCRETE PIPE** TO BE REMOVED STA. NEW RIM 3950 3950 FINISHED-STA. NEW RIM I GRADE 63.62 LF 36" RCP @ 4.61% 3945 3945 12" PVC FROM )= 3948.50 )= 3950.58 = 3948.30 165.48 LF 36" RCP @ 2.62% HENDERSON **CURB INLET** 3940 3940 125.30 LF 36" RCP @ 2.08% **EXISTING 6" WATER LOWERING** MIN. 18" SEPERATION IN (S)= IN (W) OUT = 3 18" CONCRETE FROM 3935 3935 m HENDERSON CURB INLET APPROX. UNDERGROUND TELEPHONE @ 3'-2" DEEP INSTALL CONCRETE PER CENTURY LINK 3930 3930 COLLAR AND CONNECT TO EXISTING 36" RCP 3925 3925 INV IN (S) = 3938.50INV IN (18" CONCRETE)=3938.65  $INV \overline{OUT} = 3938.31$ 3920 3920 10+50 11+00 11+50 12+00 12+50 13+00 13+50 14+00 14+50 15+00

**PLAN VIEW OF STORM DRAIN** HORIZONTAL SCALE: 1" = 50

HENDERSON STREET DRAINAGE IMPROVEMENTS **OF HELENA PROJECT 17-08** 

CITY

5 OF 7



## LANDSCAPE PLAN VIEW HOLLINS TO WAUKESHA

CLEAR FROM ALL

## **PLANTING NOTES:**

Trees planted from Euclid to Hollins will be spaced 30' apart with trees on end of planting strips to be Protective cage to be installed around PVB 10' from curb or alley edge. Trees will be planted in an alternating pattern. Trees for this section:

20' SPACING BETWEEN TREES

-Dutch Elem Resistant American Elm such as Princeton, Prairie Expedition, New Harmony, St. Croix, Mainline pipe 1 ¼" polyethylene pipe rated at 160 psi to be installed 8" Valley Forge, Catherdral, or Accolade.

- -Purple Robe Locust

at 20' apart, ont to be planted closer than 10' from 1" brass ball valve to be placed after 1" line tees off of 1 1/4" mainline power poles and planted in an alternating pattern.

Trees for this section:

- —Thornless Hawthorn such as Cockspur Thornless or Winter King
- -Crabapple with persistent fruit such as Royal Raindrops Crabapple
- -Japenese Tree Lilac

Rigid mesh tube type trunk guards affixed with UV resistant black zip ties.

Fully rmove all twin/wire basket and burlap from rootball.

Apply 4" of wood mulch feathered to tree trunk.

## **HENDERSON DRIP IRRIGATION NOTES:**

Water Department will require above ground Pressure Vacuum Breaker as close to City water feed as possible.

Concrete pad at base of PVB for cage to sit on

- 1 ¼" brass ball valve after PVB to be placed in box underground
- 12" below finished grade
- 3" PVC sleeve to be installed under alley-way and street to allow mainline and zone line to pass under right-of-way
- Trees planted from Hollins to Hudson will be spaced 1 irrigation zone per block (5 total)
  - and before the zone valve.

Hunter NODE-100 single station battery controller. 1 per zone (5 total) Hunter PCZ-101 drip control zone kit - 40 PSI. 1" inlet x %" outlet (5

total)

Zone valve to be placed in 17x 30x 15" NDS Pro Series valve box - bolt down cover (green)

1" zone line from valve to feed drip loops

1/2" poly ethylene tubing from 1" poly zone line to Netafim drip loops

Netafim Techline CV 17mm drip tubing, 12" emitter spacing, to be used to loop around trees. 20 emitters per tree to be looped around trunk 2x originating from a single T from 1/2" poly tubing and staked to ground under wood mulch.

ENA PROJECT 17-08
RSON STREET
IMPROVEMENTS HENDERS RAINAGE I

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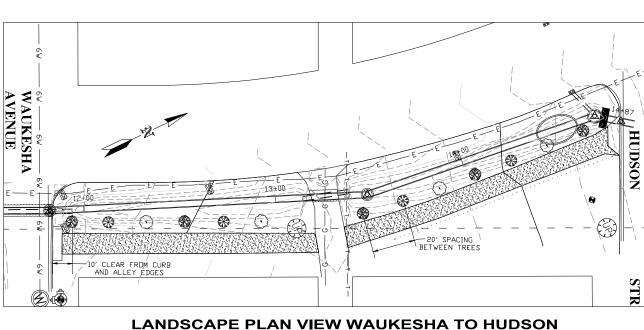
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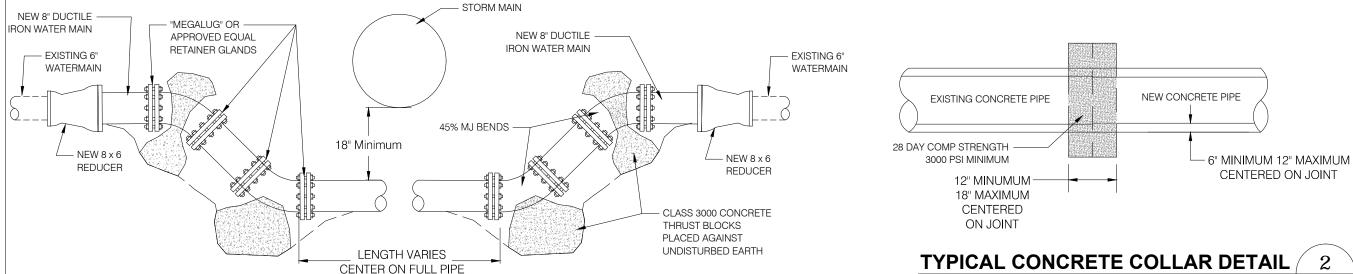
6

OF 7



SAVEN HOLL

-10' CLEAR FROM CURB



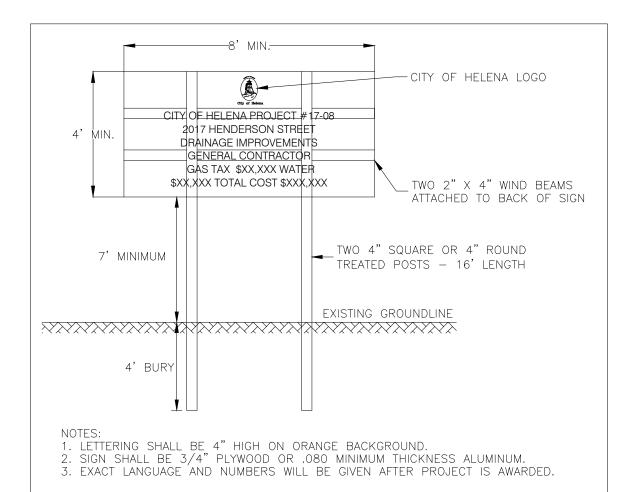
3

## TYPICAL CONCRETE COLLAR DETAIL NOT TO SCALE

CENTERED ON JOINT

WATER MAIN VERTICAL ADJUSTMENT DETAIL

NOT TO SCALE



## 4' X 8' PROJECT INFORMATIONAL SIGN DETAIL NOT TO SCALE

- 1. CHECK NATIVE SPECIES FOR ACCURACY PRIOR TO PLANTING.
- 2. KEEP PLANT MOIST AND SHADED IN MULCHED BEDS ON SITE UNTIL TIME OF PLANTING.

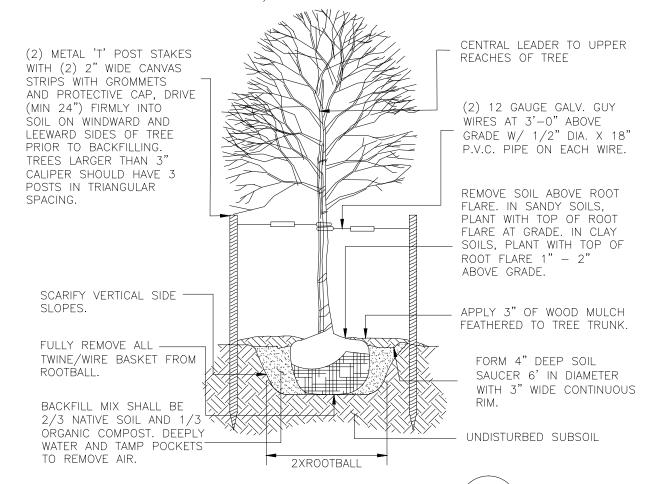
3. DO NOT DAMAGE OR CUT LEADER.

4. PRUNE ALL DAMAGED OR DEAD WOOD AFTER PLANTING, STAKING AND MULCHING.

5. KEEP CROWN SHAPE TYPICAL OF SPECIES. REMOVE ALL PLANTING TAGS, TAPE AND LABELS AFTER FINAL ACCEPTANCE BY LANDSCAPE ARCHITECT OR ECOLOGIST.

6. PROVIDE WILDLIFE PROTECTION AS NEEDED.

7. CUT AND REMOVE ALL WIRE/TWINE WRAPPING AND BURLAP.







## CITY OF HELENA PROJECT 17-08 HENDERSON STREET DRAINAGE IMPROVEMENTS

CITY

GENERAL DETAILS

SHEET NO. OF 7

TREE PLANTING DETAIL NOT TO SCALE